IN THE CLAIMS

1. (Currently amended) A medical apparatus flow restrictor, comprising:

a housing having an inlet and an outlet, and a fluid path defined through said housing between said inlet and said outlet;

at least one pair of opposed restriction devices seated within said housing between said inlet and said outlet, said restriction devices comprising opposing planar surfaces placed in contact against each other in an axial direction, a first one of said surfaces being carried on a first continuous rigid restriction device, the second one of said surfaces being carried on a second rigid restriction device that is continuous except for at least one opening therethrough, said opening being disposed in communication with said inlet and said outlet, said restriction devices defining outermost peripheral edges, said restriction surfaces disposed in said flow path such that fluid delivered to said inlet always passes between said opposing surfaces via said outermost peripheral edges of said restriction devices and said opening of said first continuous restriction device prior to flowing from said outlet; and

wherein said opposing surfaces have a random surface roughness and opposed surface area defining a random flow field between said opposed surfaces, the degree of said random surface roughness and surface area of said random flow field defined as a function of a desired flow rate of fluid through said restrictor, and wherein said random flow field is defined by a random pattern of voids, spaces, valleys and protrusions between said opposing planar surfaces and defines the sole regulated restrictive flow path through said restrictor for delivering a desired flow rate.

2. (Original) The restrictor as in claim 1, wherein said restriction devices comprise opposed flat planar members disposed within said housing such that fluid from said inlet flows radially between said opposing surfaces of said flat planar members.

3. (Previously presented) The restrictor as in claim 2, wherein a flow path is defined within said housing such that the fluid flows to a perimeter of said flat planar members and migrates radially inward between said opposing surfaces of said flat planar members.

4. (Withdrawn) The restrictor as in claim 2, wherein a flow path is defined within said housing such that the fluid flows through an orifice in upstream one of said flat planar members and then flows radially outward between said opposing surfaces of said flat planar members.

5. (Withdrawn) The restrictor as in claim 1, wherein said restriction devices are formed of a hard, con-compressible material such that fluid flow between said opposing surfaces is substantially constant regardless of a compressive pressure applied to said restriction devices.

6. (Currently amended) A medical apparatus flow restrictor, comprising:

a housing having an inlet and an outlet, and a fluid path defined through said housing between said inlet and said outlet;

at least one pair of opposed restriction devices seated within said housing between said inlet and said outlet, said restriction devices comprising opposing planar surfaces placed in contact against each other <u>in an axial direction</u>, <u>a first one of said surfaces being carried on a first continuous rigid restriction device, the second one of</u>

said surfaces being carried on a second rigid restriction device that is continuous except for at least one opening therethrough, said opening being disposed in communication with said inlet and said outlet, said restriction devices defining outermost peripheral edges, said restriction surfaces disposed in said flow path such that fluid delivered to said inlet always passes between said opposing surfaces via said outermost peripheral edges of said restriction devices and said opening of said first continuous restriction device prior to flowing from said outlet;

wherein said opposing surfaces have a relative degree of surface roughness and opposed surface area defining a random flow field as a function of a desired flow rate of fluid through said restrictor, and wherein said random flow field is defined by a random pattern of voids, spaces, valleys and protrusions between said planar opposing surfaces and defines the sole regulated flow path through said restrictor; and

wherein said restriction devices are formed of a compressible material such that fluid flow between said opposing surfaces is varied by varying a compressive pressure applied to said restriction devices.

7. (Original) The restrictor as in claim 1, wherein said housing comprises separate halves, said restriction devices placed within said halves prior to joining said halves to form said housing.

8. (Original) The restrictor as in claim 7, wherein said halves are separable after being joined for access to said restriction devices.

9. (Original) The restrictor as in claim 7, wherein said halves are permanently and non-separably joined.

10. (Original) The restrictor as in claim 1, further comprising a seal disposed within said housing relative to said restriction devices to ensure that fluid flow through said restrictor does not bypass said fluid flow path between said opposing surfaces.

11. (Original) The restrictor as in claim 10, wherein at least one of said restriction devices comprises an orifice defining a flow path for the fluid into or out from said opposing surface of said restriction devices, said seal disposed adjacent said restriction device having said orifice.

12. (Previously presented) The restrictor as in claim 1, wherein said restriction devices comprise opposed flat discs disposed within said housing such that fluid from said inlet flows to a perimeter of said discs and migrates radially inward between said opposing surfaces, said disc closest to said outlet comprising an orifice through which fluid flows from between said opposing surfaces to said outlet.

13. (Original) The restrictor as in claim 12, further comprising a sealing ring disposed within said housing between said outlet and against an outer side of said disc closest to said outlet.

14. (Original) The restrictor as in claim 12, wherein said housing comprises separate halves, said discs placed within said halves prior to joining said halves to form said housing.

15. (Original) The restrictor as in claim 1, wherein said restriction devices are disposed such that a plane between said opposing surfaces is generally perpendicular to an axis of said inlet and said outlet.

16. (Withdrawn) The restrictor as in claim 1, wherein said restriction devices are disposed such that a plane between said opposing surfaces is generally parallel to an axis of said inlet and said outlet.

17. (Original) The restrictor as in claim 1, wherein said inlet and said outlet are connectable to tubing in fluid delivery system such that said restrictor is placeable in-line within said system.

18. (Original) The restrictor as in claim 1, wherein said opposing surfaces are disposed in a generally flat plane essentially perpendicular to an axis of said inlet and said outlet.

19. (Withdrawn) The restrictor as in claim 1, wherein said opposing surfaces are disposed in a generally conical plane between said inlet and said outlet.

20. (Withdrawn) The restrictor as in claim 1, wherein said opposing surfaces are disposed in a generally curved plane between said inlet and said outlet.

21. (Original) The restrictor as in claim 1, wherein said surface roughness of at least one of said opposing surfaces is defined in any one or combination of a controlled grinding, lapping, tumbling, sandblasting, or etching process.

22. (Original) The restrictor as in claim 1, wherein each of said opposing surfaces is roughened.

23. (Withdrawn) The restrictor as in claim 1, wherein only one of said opposing surfaces is roughened as compared to said other opposing surface.

24. (Withdrawn) The restrictor as in claim 1, wherein said restriction devices comprise a ball element seated within a ball seat, said opposing surfaces defined by a circumferential portion of said ball element and said ball seat.

25. (Withdrawn) The restrictor as in claim 1, further comprising a biasing element disposed within said housing so as to bias said restriction devices together.

26. (Currently amended) A medical fluid delivery system configured to deliver a fluid from a source to a patient at a regulated flow rate, said system comprising delivery tubing and a flow restrictor placed in-line in said tubing, said flow restrictor further comprising:

a housing having an inlet and an outlet, and a fluid path defined through said housing between said inlet and said outlet;

at least one pair of opposed restriction devices seated within said housing between said inlet and said outlet, said restriction devices comprising opposing planar surfaces placed in contact against each other in an axial direction, a first one of said surfaces being carried on a first continuous rigid restriction device, the second one of said surfaces being carried on a second rigid restriction device that is continuous except for at least one opening therethrough, said opening being disposed in communication with said inlet and said outlet, said restriction devices defining outermost peripheral edges, said restriction surfaces disposed in said flow path such that fluid delivered to said inlet always passes between said opposing surfaces via said outermost peripheral edges of said restriction devices and said opening of said first continuous restriction device prior to flowing from said outlet; and

wherein said opposing surfaces have a random surface roughness and opposed surface area defining a random flow field between said opposed surfaces, the degree of said random surface roughness and surface area of said random flow field defined as a function of a desired flow rate of fluid through said restrictor, and wherein said random

flow field is defined by a random pattern of voids, spaces, valleys and protrusions between said planar opposing surfaces and defines the sole regulated flow path through said restrictor.

27. (Original) The fluid delivery system as in claim 26, wherein said flow restrictor is disconnectable from said tubing.

28. (Previously presented) The fluid delivery system as in claim 26, wherein said restriction devices comprise opposed flat planar members disposed within said housing such that fluid from said inlet flows from a perimeter of said flat planar members and migrates radially inward between said opposing surfaces of said flat planar members.

29. (Previously presented) The fluid delivery system as in claim 26, wherein said housing comprises separate halves, said restriction devices placed within said halves prior to joining said halves to form said housing.

30. (Previously presented) The fluid delivery system as in claim 26, further comprising a seal disposed within said housing relative to said restriction devices to ensure that fluid flow through said restrictor does not bypass said fluid flow path between said opposing surfaces.

31. (Previously presented) The fluid delivery system as in claim 26, wherein said restriction devices comprise opposed flat discs disposed within said housing such that fluid from said inlet flows to a perimeter of said discs and migrates radially inward between said opposing surfaces, said disc closest to said outlet comprising an orifice through which fluid flows from between said opposing surfaces to said outlet, and

further comprising a sealing ring disposed within said housing between said outlet and against an outer side of said disc closest to said outlet.

32. (Original) The fluid delivery system as in claim 26, wherein said restriction devices are disposed such that a plane between said opposing surfaces is generally perpendicular to an axis of said inlet and said outlet.

33. (Withdrawn) The fluid delivery system as in claim 26, wherein said restriction devices are disposed such that a plane between said opposing surfaces is generally parallel to an axis of said inlet and said outlet.